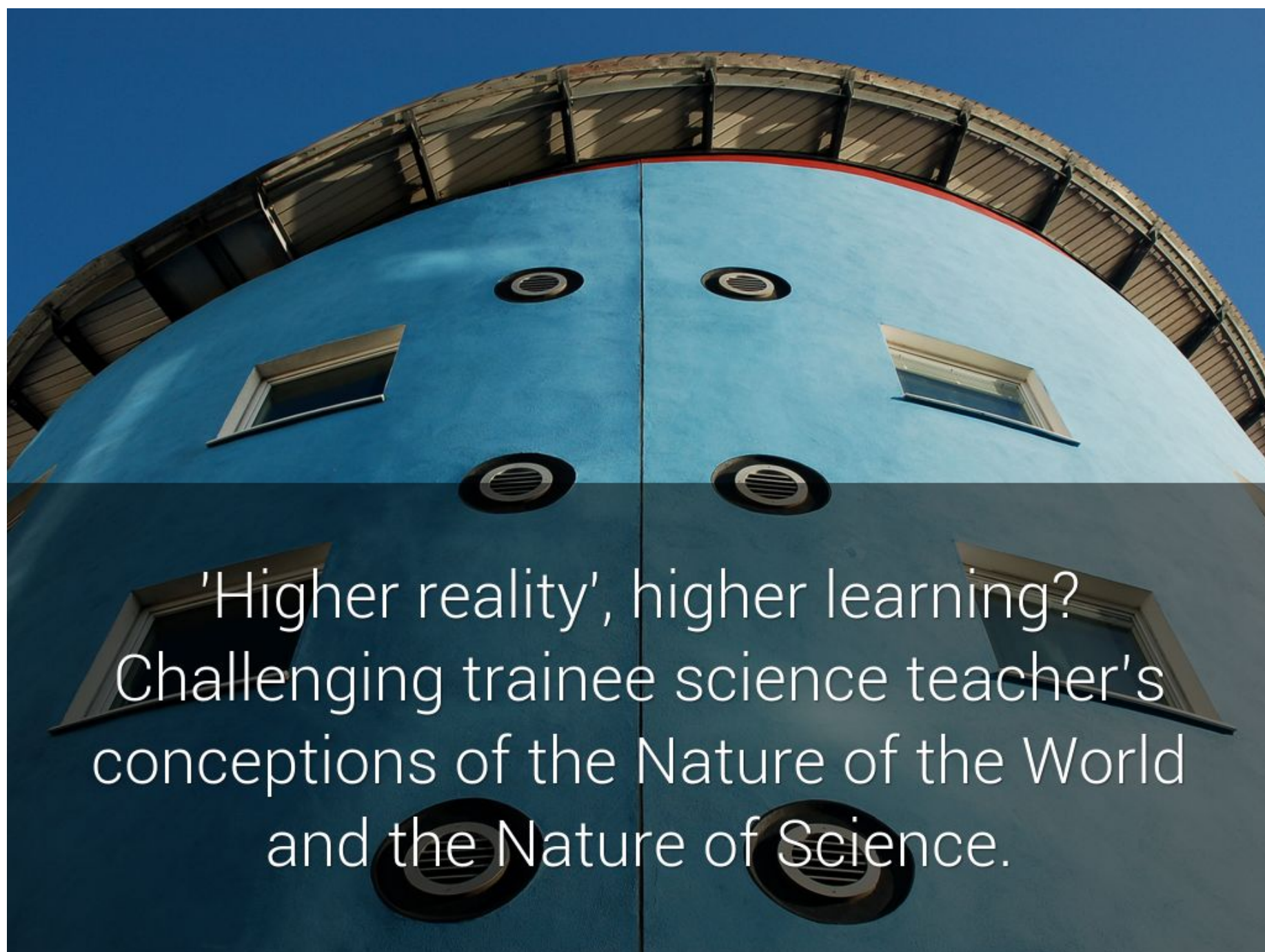


'Higher reality'? Higher learning.



'Higher reality', higher learning? Challenging trainee science teacher's conceptions of the Nature of the World and the Nature of Science.

The focus of this small scale qualitative study is to explore an alternative way of gaining knowledge about the 'world' and the impact this has on pre-service secondary science trainees in England.

This study will examine the interplay between Buddhism and science with a particular emphasis on the Abhidhamma. Abhidhamma translates as 'higher reality' or 'higher teaching' from the Theravada tradition of Buddhism. (Gorkom, 2014, p1)

Seeing, hearing, touching, tasting, sights, sounds are Abhidhamma. This moment is Abhidhamma. The study removes unverifiable elements from both Buddhism and science, concerning itself only with 'How They Work?'.

Author: Alan Weller, Senior Lecturer in Physics, University of East London. 24/6/15

NB. References are in the notes page of the last slide.

WHY?

We teach in one of the most diverse religious and ethnic populations in Europe. We need to teach with empathy and understand the faith issues and conflicts which surround the teaching of science without compromising on the science itself. We also need to understand the boundaries of science and not make assumptions which go beyond what we know.

London has centres of worship for a multitude of faiths. According to the 2011 Census, the largest religious groupings are Christians (48.4 per cent), followed by those of no religion (20.7 per cent), no response (8.5 per cent), Muslims (12.4 per cent), Hindus (5.0 per cent), Jews (1.8 per cent), Sikhs (1.5 per cent), Buddhists (1.0 per cent) and other (0.6 per cent). ('Religion in London', • 2015)

Although Buddhism only represents 1% of the faiths in London, it is taught in many schools as a part of a broad religious curriculum. Therefore, there are benefits to understanding the relationship with science and being able to answer possible conflicting views.

Cross Curricula, of benefit to both? Religious classes have a different way of working to science and so can perhaps both can benefit from each other's way of working. Also perhaps Buddhism can help science and vice versa.

However there are two key issues that this study raises. Consider the following slide.

Can you cycle faster than the speed of light?

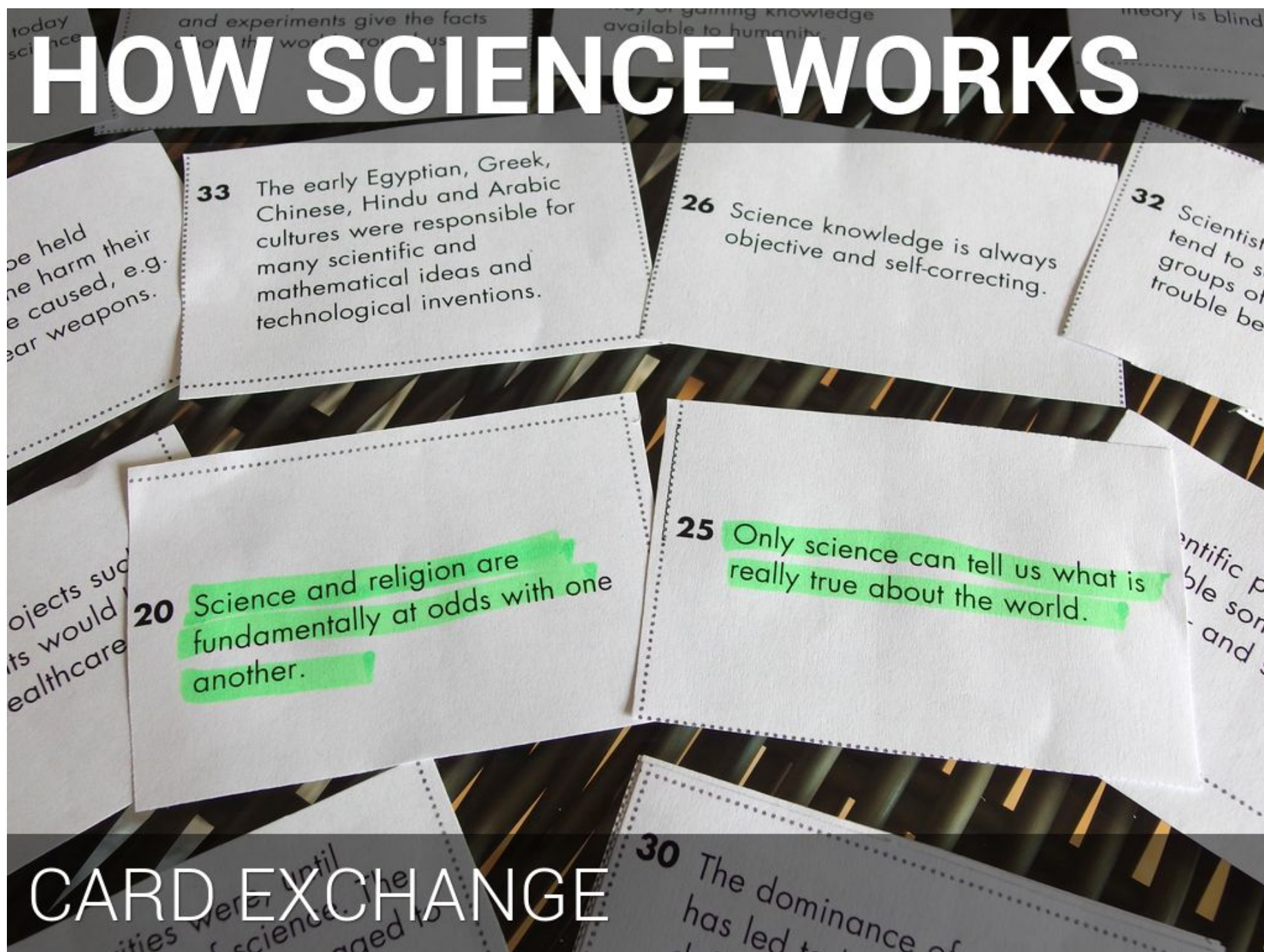


If you ask science trainees this question: "Can you cycle faster than the speed of light?" This answer is invariably no.

They are wrong!

There is an assumption behind the answer namely that the speed of light is 300 million metres per second. It is , but only in a vacuum. The speed of light can be slowed down to 17 metres per second in some substances and you can cycle faster than that! (Lene Hau, 2015)

We all make assumptions about religion and the nature of the world.



The above Card Exchange (Kind, 2008) is a typical activity for science teacher trainees to clarify their views on the nature of science. Cards are sorted in order, according to their closest match to the way science works. The above highlighted statements sit very uncomfortably in the mix.

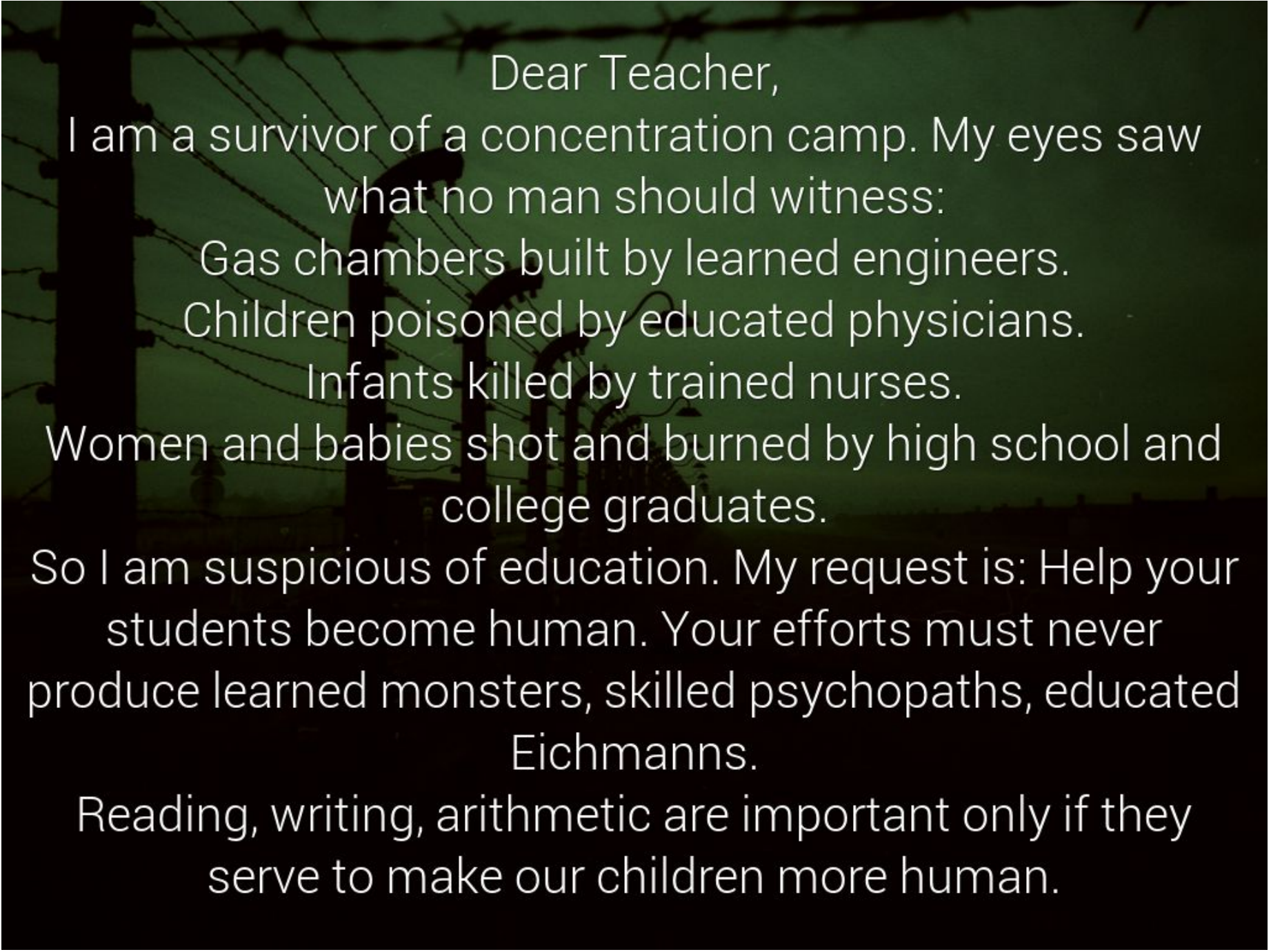
Emerging from this are these two key issues.
Firstly:

Is there another way which can tell us what is really true about the world?



All of the understanding we have of the world is through intellectual understanding (conceptual understanding) but is there anything else?

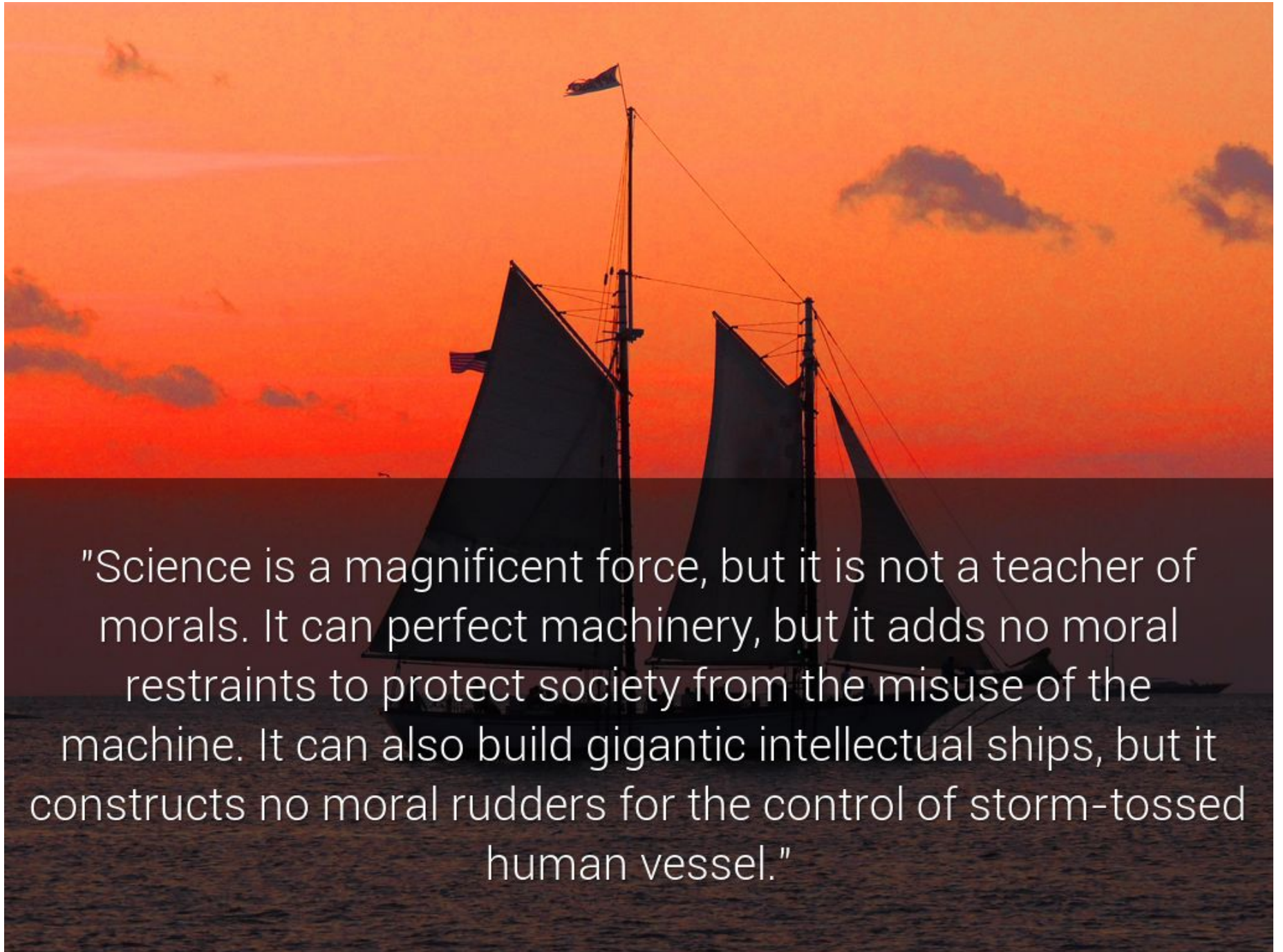
SAFEGUARDING



Dear Teacher,
I am a survivor of a concentration camp. My eyes saw
what no man should witness:
Gas chambers built by learned engineers.
Children poisoned by educated physicians.
Infants killed by trained nurses.
Women and babies shot and burned by high school and
college graduates.
So I am suspicious of education. My request is: Help your
students become human. Your efforts must never
produce learned monsters, skilled psychopaths, educated
Eichmanns.
Reading, writing, arithmetic are important only if they
serve to make our children more human.

This quote was sourced from a TEL (Technology Enhanced Learning) assignment by one of my students.

"It has been difficult to trace the source of this letter, it seems to be from an unknown survivor, and the letter is first quoted by Haim Ginott in his book *Teacher and Child* (1993)." (Huleatt, 2015, p10)



"Science is a magnificent force, but it is not a teacher of morals. It can perfect machinery, but it adds no moral restraints to protect society from the misuse of the machine. It can also build gigantic intellectual ships, but it constructs no moral rudders for the control of storm-tossed human vessel."

William Jennings Bryan's summation of the Scopes trial (distributed to reporters but not read in court). ('Scopes Trial', 2015)

This is not a problem of science but a problem of making science your god. There are many well known scientists who are religious.

Richard Dawkin: (Dawkin, 2015)

"I am against religion because it teaches us to be satisfied with not understanding the world."

"...when two opposite points of view are expressed with equal intensity, the truth does not necessarily lie exactly halfway between them. It is possible for one side to be simply wrong."

Richard Dawkin (Dawkin, 2015)

The top statement by Richard Dawkin is ambiguous unless the word religion is defined. Arguably science is a religion for some, in that they make it their god and do not consider anything else. Therefore the statement could refer to himself?

The below statement shows the precision of the scientist and is a useful parameter for this study in that it guides us to a distinct conclusion.

'Higher reality'? Higher learning.



SCIENCE AND BUDDHISM HARMONY OR CONFLICT?

There are two heavyweights at understanding the world: Buddhism and Science.

Is one right, the other wrong is there a parallel universe?

What is the relationship between them? Can we know the relationship between them?

Yes by the end of this presentation!

What are some conflicts?

28 physical elements (Gorkom, 2009, p66) or 100 elements?

A person knows the truth about the world about life, but does not mention any science. No Newtons laws, no theory of evolution, no cures for disease?

What do they have in common?

Looking at 14 Big Ideas of Science (Harlen et al., 2010), and 14 Big Ideas of Buddhism ('14 Big Ideas of Buddhism', 2015). They only have 1 Big Idea in common.

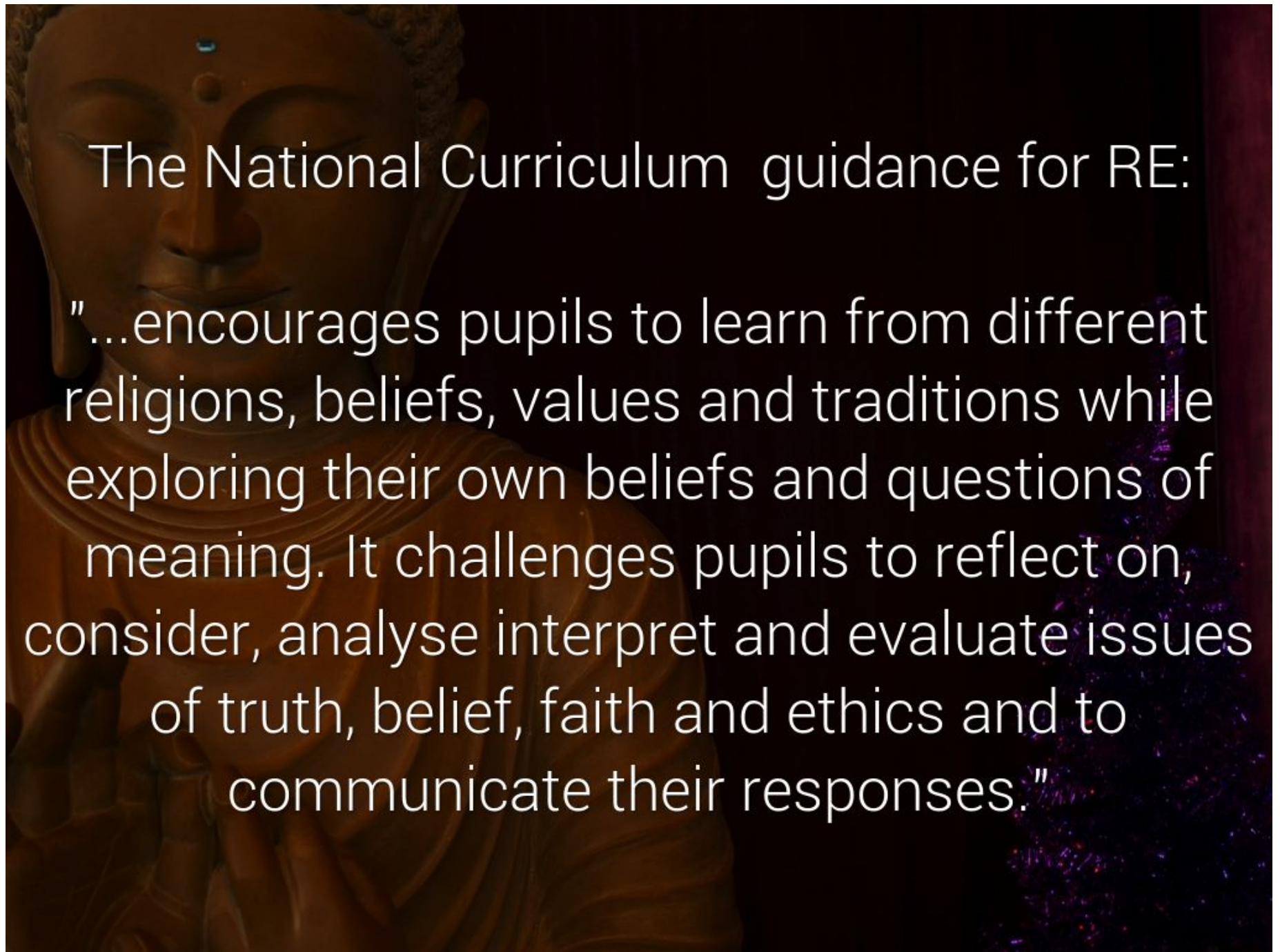
'Higher reality'? Higher learning.



All 'worldly' phenomena are conditioned.

However Buddhism extends this principal also to mental phenomena such as anger. Therefore immorality is also conditioned.

Perhaps scientists may make better Buddhists as they are used to working with this idea?



National Curriculum
(cited in Holt, 2015, p6).

Using these ideas. Trainee science teachers are challenged with the following question.



Conventional evidence comes in the form of; ships masts on the horizon; angle of the sun at different circumferences; pictures from space; circumnavigating the world.

Note the Greeks calculated the radius of the Earth to a good approximation around 200bc.('Eratosthenes',• 2015)

HIGHER LEARNING, HIGHER PEDAGOGY?

1. Diagnostic Test
2. The Science
3. Lego
4. Shortbread biscuits

The opposing argument is put using four strategies underpinned by a single pedagogy.

The background picture comes from the Matrix:

The Matrix: Synopsis

"Computer hacker Neo is contacted by underground freedom fighters who explain that reality as he understands it is actually a complex computer simulation called the Matrix. Created by a malevolent Artificial Intelligence, the Matrix hides the truth from humanity, allowing them to live a convincing, simulated life in 1999 while machines grow and harvest people to use as an ongoing energy source. ('The Matrix - Synopsis', 2015)

Neo lived in an 'artificially fabricated reality'. He was in fact plugged in to a super computer which controlled all his perceptions.

Analogous to this we live now in a 'fabricated reality' a parallel universe.

In order to get a glimpse of this we have to recognize what is truly real and what is merely an idea or false perception.

The underpinning pedagogy is:

We use concepts in
the right way to make
known realities.

We use concepts in the right way in order to make known realities. Derived from:
(Boriharnwanaket, 2006, Concepts)

'Higher reality'? Higher learning.



What do you see?

The diagnostic test. Two simple questions, two simple answers, but enough to diagnose understanding of reality?

'Higher reality'? Higher learning.



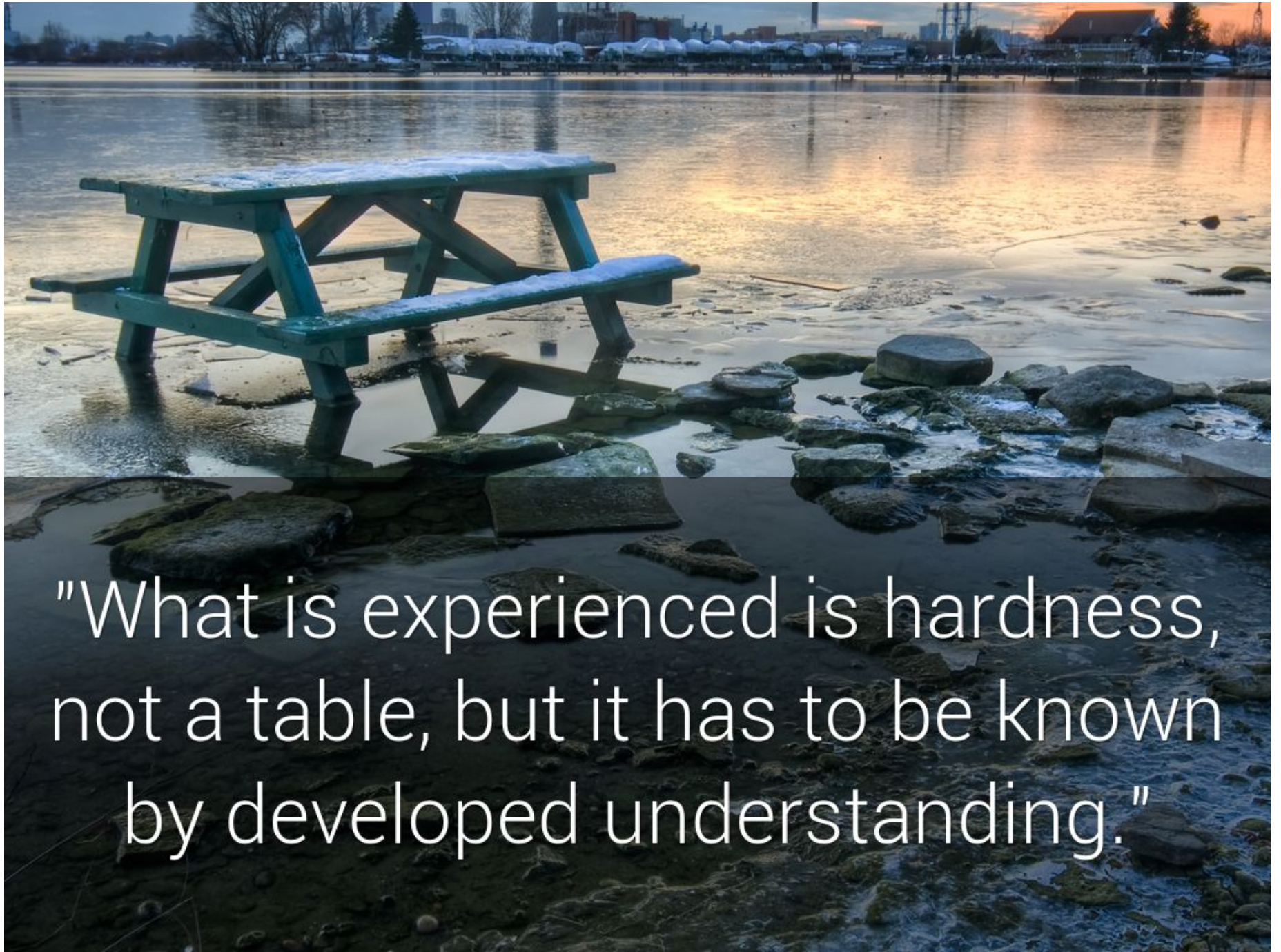
What can you touch?

Typical answers such as chair, table, person shows the reality is hidden.

We can only touch: hardness or softness, hot or cold, motion or pressure.

We experience a reality and this is immediately followed by thinking. Table is a concept the object of thinking.

'We used to think that a cushion or a chair could be experienced through touch. When we are more precise, it is hardness or softness that can be experienced through touch. Because of remembrance of former experiences we can think of a cushion or chair and we know that they are named "cushion" or "chair". This example can remind us that there is a difference between ultimate realities and concepts we can think of but which are not real in the ultimate sense.' (Gorkom, 2009, p2)

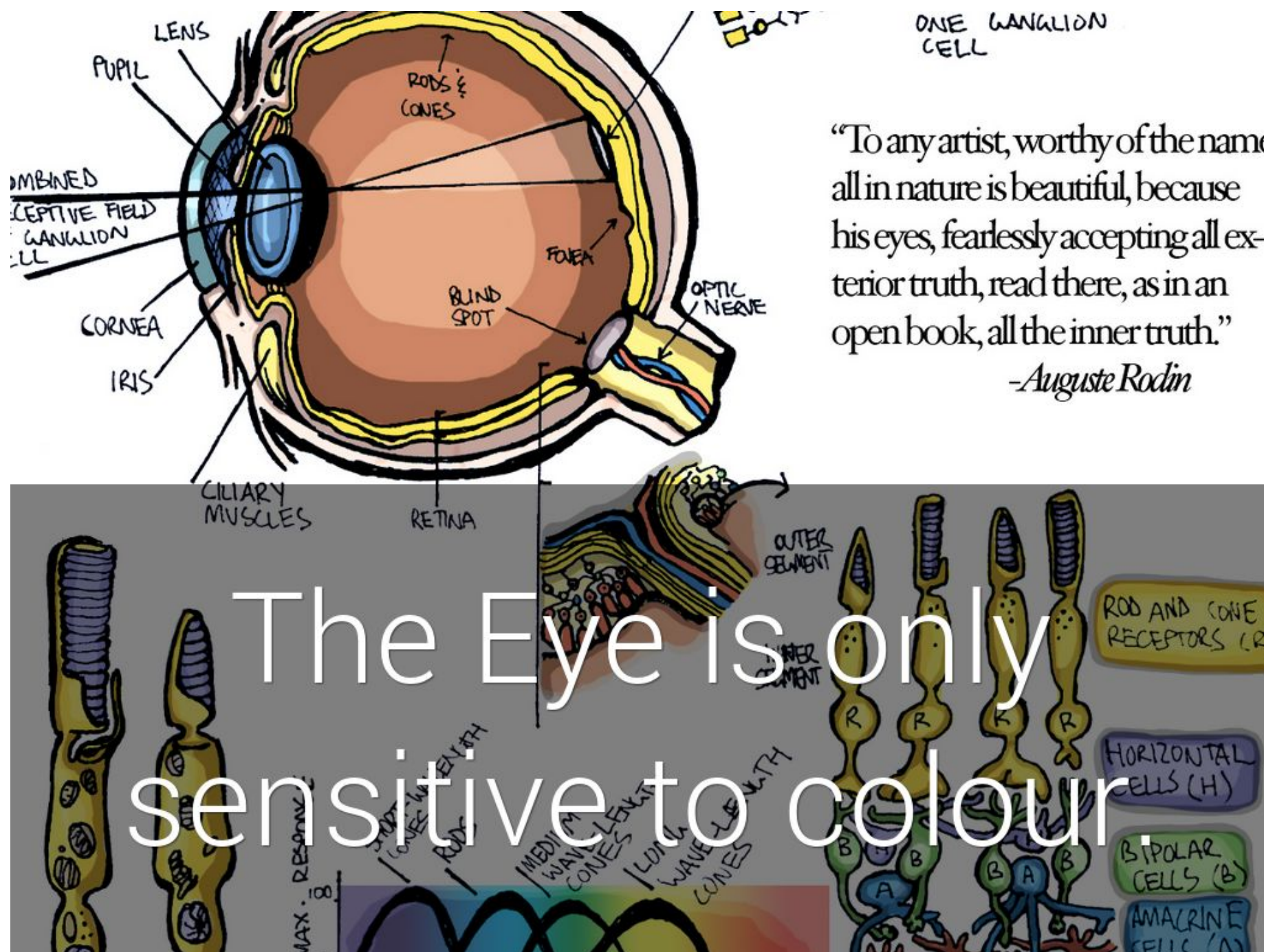


"What is experienced is hardness, not a table, but it has to be known by developed understanding."

What is experienced is hardness, not a table, but it has to be known by developed understanding.
(Abbott and Weller, 2010)

The developed understanding here is not intellectual understanding but understanding of reality by direct experience.

'Higher reality'? Higher learning.



The eye is only sensitive to colour. Three colours: red, green, blue.

The description of what is seen typically computer screen, person, table. However this does not accurately describe what is seen. There will always be an object that is missed out. Seeing sees what is visible, immediately this is followed by thinking in concepts.

Person, computer, table, chairs cannot be seen, they are perceived.

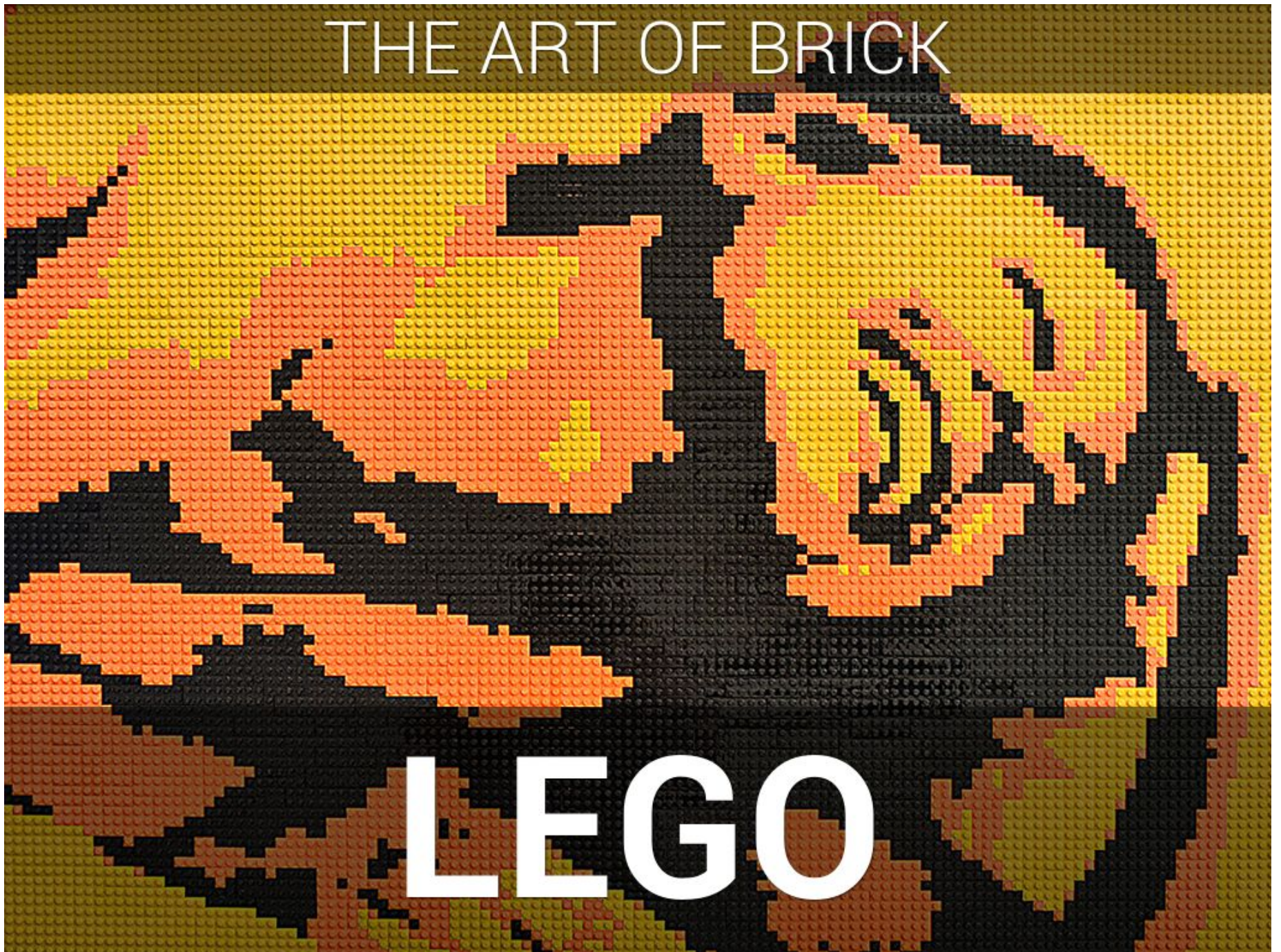
"We may find it difficult to know what visible object is, since we are usually absorbed in paying attention to the shape and form of things.

When we perceive the shape and form of something, for example of a chair, we think of a concept. A chair cannot impinge on the eyesense.

Seeing does not see a chair, it only sees what is visible. Seeing and thinking occur at different moments. We do not think all the time, also moments of just seeing arise, moments that we do not pay attention to shape and form. Only one citta (consciousness) at a time arises experiencing one object, but different experiences arise closely one after the other.

...

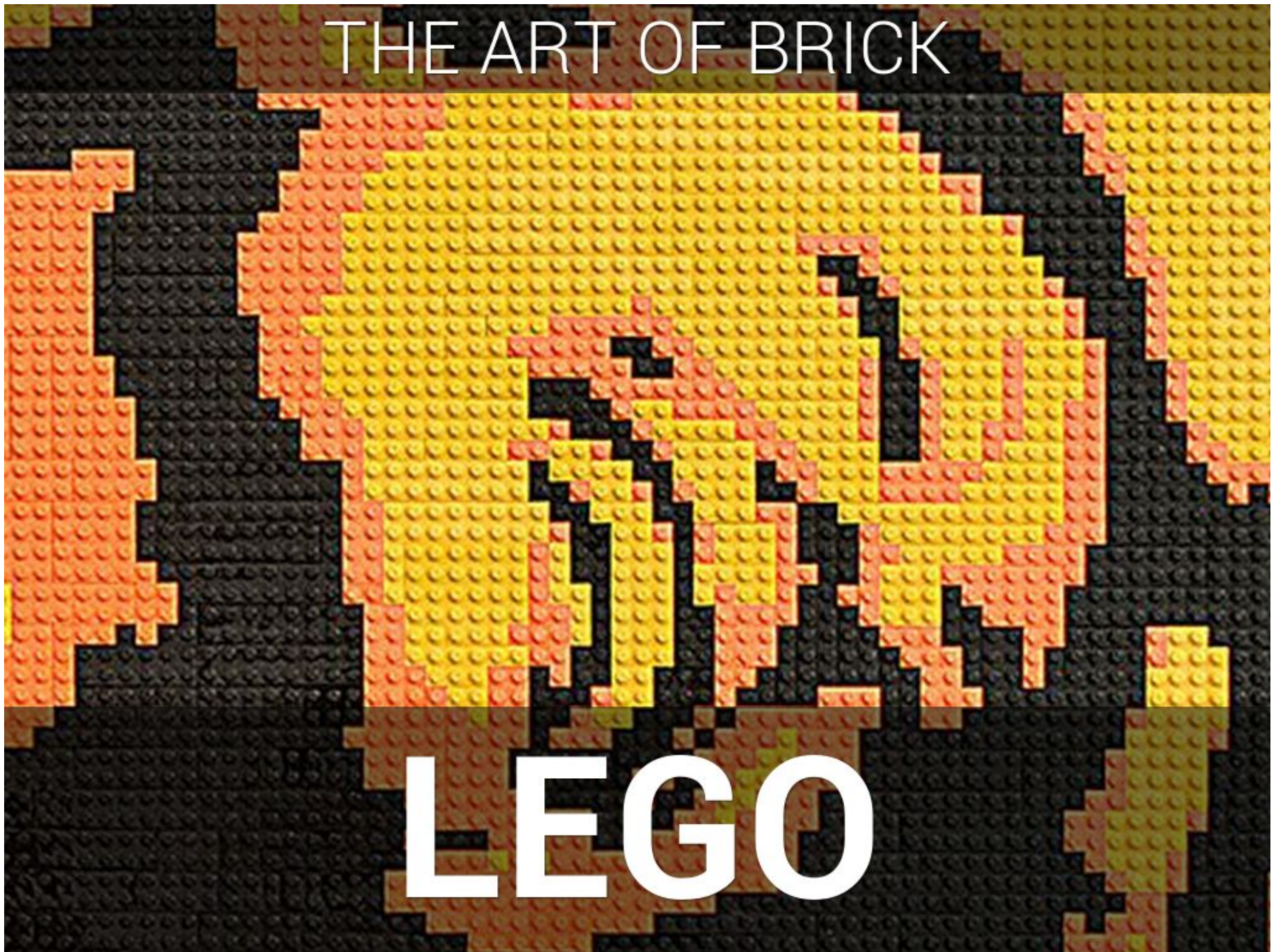
'Higher reality'? Higher learning.



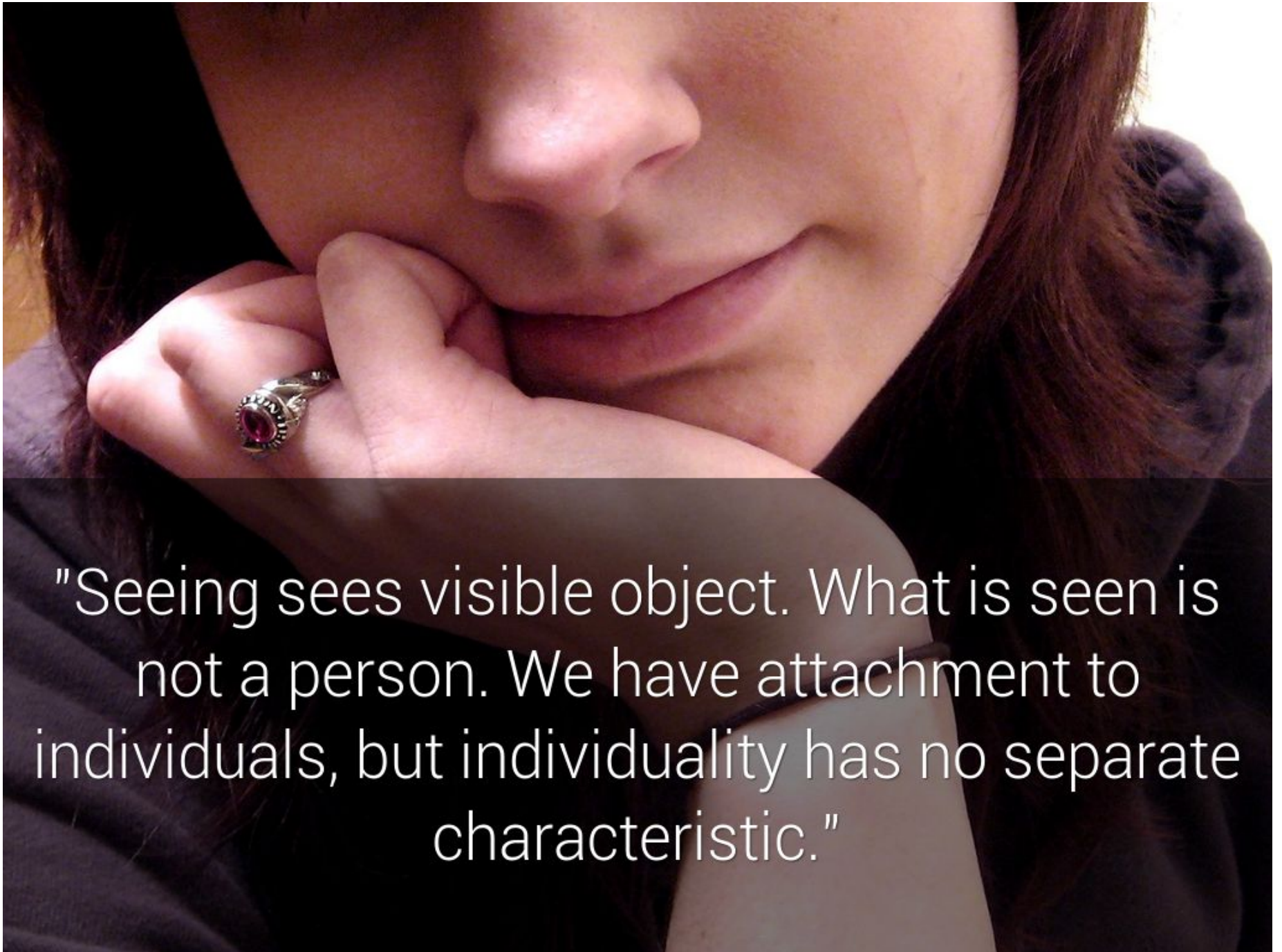
(brickartist, 2015)

With just three colours, an idea of person is formed. The process is the same no matter we are seeing 'real people' or in a film. Person is an idea, conditioned by the visible object which is seen.

'Higher reality'? Higher learning.



A closer look at the bricks and the idea of person dissolves.



"Seeing sees visible object. What is seen is not a person. We have attachment to individuals, but individuality has no separate characteristic."

If we see people or things it shows there is ignorance of what is seen as just a reality.

Going back to the round earth. What is seen is not round. Roundness is an idea. What is seen is visible only.

Derived from Concepts
(Boriharnwanaket, 2006, Concepts)

I LIKE the TASTE of shortbread biscuits.
I am in a lecture theatre LISTENING to Alan
SPEAK.

I SEE on the board several statements
concerning concepts and REALITIES.
I LIKE the SOUND of Jimi Hendrix's guitar.
When I TOUCH the gas tap my finger FEELS
COLD.

I THINK therefore I am.
The UNDERSTANDING which understands
conditioned REALITIES is also conditioned

We are using words to make known realities (in capitals).

The words in capitals represent real phenomena. They arise whether we think or do not think.

The lower caps words only arise with thinking, they are concepts the object of thinking.

Abhidhamma uses words to make known realities, but the realities of life are not words.

Derived from (Boriharnwanaket, 2006, Concepts)

'Higher reality'? Higher learning.



Nobody can condition any reality
(Abbott and Weller, 2010)
The understanding which understands conditioned realities is conditioned.

BUDDHISM:
Understanding has a 'reality'
as its object.

SCIENCE:
Understanding has a
concept as its object.

'Higher reality'? Higher learning.

ABSOLUTE TRUTH



THE SHADOW: CONVENTIONAL TRUTH

With science we can build many gadgets, cure diseases but what can we do with seeing realities as they are?
Consider:

'Higher reality'? Higher learning.



The Pantiles Tunbridge Wells.

We are attached to many things: Trendy shops, smart people, beautiful environments.

'Higher reality'? Higher learning.



Attachment is a condition for aversion.

BBC1, Have I got news for you, 29th April 201

Attachment is a condition for aversion?

8

3

0

Yes

Sometimes

No

Concepts vs Realities

4

True: Science
understands
concepts, Buddhism
realities.

6

Maybe: Science
understands
concepts, Buddhism
realities.

1

False: Science
understands
concepts, Buddhism
realities.

The understanding science has of reality is zero?

4

True

7

Depends on the
definition of reality

1

False

'Higher reality'? Higher learning.

Do you consider the session to be relevant to your teaching?

11

0

Yes

No

"Because we are going to teach in a very diverse environment with people with very different beliefs."

"It provides me with information just in case students ask about it in class."

"Because it encouraged us to consider other world views, & other views on reality, which is, ultimately, what most scientists would like to consider science as being about."

"It allowed me to see another perspective that some of my students may hold."

Alan Weller

Senior Physics Lecturer
Cass School of Education
University of East London

Reference and notes:

<https://www.haikudeck.com/higher-reality-higher-learning-education-presentation-0X8JKQ1W87>



Author: Alan Weller, Senior Lecturer in Physics, University of East London. 24/6/15

References

14 Big Ideas of Buddhism [WWW Document], 2015. URL <https://www.haikudeck.com/14-big-ideas-of-buddhism-education-presentation-JO34vH3Vnm> (accessed 5.22.15).

Abbott, S., Weller, A., 2010. phrases.pdf [WWW Document]. URL <https://ia600608.us.archive.org/16/items/PhrasesOnBuddhism/phrases.pdf> (accessed 5.22.15).

Boriharnwanaket, S., 2006. A Survey of Paramattha Dhammas. zolag, London.

brickartist [WWW Document], 2015. URL <http://www.brickartist.com/> (accessed 5.22.15).

Dawkin, R., 2015. Richard Dawkins quotations and quotes about God - Religion - Faith - Religious Beliefs [WWW Document]. URL http://www.age-of-the-sage.org/quotations/quotes/richard_dawkins_god.html (accessed 1.27.15).

Eratosthenes, 2015. . Wikipedia Free Encycl....